SEAMOUNT CONTROL DURING GRAVITY-DRIVEN EXTENSION INVOLVING MULTI-LAYERED EVAPORITES: INSIGHTS FROM ANALOG MODELS

Author: Andres Cadavid Garces. Candidate to MSc. Reservoir Geology and Geophysics.
Tutor: Dr. Oriol Ferrer

ABSTRACT

Using experimental sandbox models and seismic interpretation, this research is focused to characterize the role played by pre-salt seamounts during gravitational gliding in salt-bearing passive margins, and specifically how this affect the margin. The research was carried out by the interpretation of a 2D seismic survey of the Provençal Basin (Western Mediterranean) that was used as a seed to identify the constraints in the experimental program. As a previous research stated the deep margin of this basin includes three main structural domains controlled by the gravitational failure of the sedimentary overburden above the post-rift Messinian evaporites that act as a detachment. Salt rollers with growth normal listric faults characterize the updip extensional domain. Extension is downdip accommodated by a contractional domain with squeezed diapirs and buckle folds. Between them the overburden is passively transported downdip in a translational domain. In this ideal scenario the salt flow is assumed downdip without flowing restrictions. Nevertheless, pre-existing reliefs (e.g. seamounts) could interfere the gravitational gliding and the salt flow develops local secondary structures that modify the regional architecture of the margin. As seismic data stated, the analog models also showed how these reliefs constrains the kinematic of the salt flow acting as a buttress to the gravitational failure. These structures should be taken into account during exploration of similar areas because they can generate secondary traps or promote the hydrocarbons migration in the areas where salt has been depleted, modifying the plays of the area.

Key words: Salt-bearing passive margins; Provençal Basin; pre-salt seamounts; analog modeling; salt tectonic.